

being more prominent in some species than in others, that the beautiful appearance of Bat's hair depended. The scales might be procured either by scraping the hair with a knife in a direction from the apex towards the root, or more easily by pressing them between glasses previously moistened by the breath. Many of them appeared to terminate in a quill, like that observed on the butterfly's scale; some few were flat, whilst others were curved, so as to fit the shaft of the hair, and presented a serrated edge. The scales were absent near the bulb, but abounded in all parts of the shaft situated above the skin; and when removed from many of the larger hairs, the fibrous nature of the shaft and its cellular interior were well displayed. He spoke of the hair of an Indian Bat, of which a small portion had been given him by Mr. Powell, in which, without any preparation, the scales could be beautifully seen, both detached and still adherent to the shaft; and he was led, from repeated observation, to consider a Bat's hair as composed of a shaft invested with scales, which are developed to a greater or less degree, and vary in the mode of their arrangement in the different species of these animals; and concluded by stating that Bats resembled quadrupeds principally in their mode of reproduction, and birds in their mode of progression, but resembled both in the structure of their hair.

Some discussion followed the reading of the paper, in which the President and others took a part.

MISCELLANEOUS.

Cyclostoma elegans, Lam., an Irish Shell.—In my catalogue of the Land and Freshwater Mollusca of Ireland, published in the 6th vol. of the 'Annals,' it is considered that there are not sufficient data for ranking *Cyclostoma elegans* with our indigenous species. I have lately seen a number of specimens of this shell, and am now enabled to announce it as such, although not so satisfactorily as could be wished. These were found by Mrs. W. J. Hancock washed up by the tide upon the strand at Mullaghmore, near Bundoran, on the western coast. Whether the *Cyclostoma* tenants the neighbouring sand-hills, or is brought from a distance by rivers to the ocean and then cast upon the beach where the examples here mentioned were obtained, is yet to be learned. Fully a hundred of them were collected in one day.

In reference to a *Cyclostoma* which Dr. Turton stated had been found in the west of Ireland, I troubled Mr. Jeffreys with some queries, which were replied to as follows, in a letter dated Swansea, Aug. 30, 1841:—"The specimen of *Cyclostoma productum* (Turton) which I received from Mr. Clark as forming part of the late Dr. Turton's collection is well figured in his 'Manual,' but it does not agree with the figure or description of *C. sulcatum* of Draparnaud, to which Dr. Turton doubtfully referred it. I have no doubt that it is an exotic shell, and that Mr. Gray's account of it (in his edition of 'Turton's Manual') is correct."—WM. THOMPSON.

Belfast, Sept. 1841.

Entophytes.—*Cryptogamous Plants developed on the internal surface of the air-cells of an Eider Duck (Anas mollissima) whilst alive.* From a letter of M. E. Deslongchamps to M. V. Audouin (Comptes Rendus, 1841, June 14).

The growth of Cryptogamous vegetables upon living animals has been placed beyond doubt by the researches of MM. Audouin and Bassi on the disease of Silk-worms called Muscardine, and which those naturalists have shown to be attributable to the metamorphosis of the fatty tissue of the insect into the radicle or thallus of a new cryptogamic plant, which M. Audouin has named *Botrytis bassiana*. Some analogous facts have since then been collected*. M. Deslongchamps had occasion to open an Eider Duck, which having been taken by some fishermen in nets placed on the coast of the Channel, was in a certain degree tamed, and lived some months in a poultry-yard in company with domestic ducks. It died after having for near a month appeared to suffer greatly from an increasing difficulty of breathing. M. Deslongchamps found the air-cells lined within by large patches of mould. Those of the left side exhibited mould of long standing and in full maturity, for the sporules were fully developed, of a deep dull green, and united in capitula supported upon straight filaments. In those of the right side the mould appeared recent, and without a green tint. They appeared under the microscope as transparent filaments, not articulated, little or not at all branched, forming a felting which appeared more compact the nearer they were to the false albuminous membrane which served to support them, and where their diameter was exceedingly small. A great quantity of minute globular or oval vesicles appeared everywhere in this felted mass, of the same diameter as that of the filaments, and which are doubtless the sporules. They were sometimes white, sometimes of an ashy greenish colour. In the mould-spots of the longest standing were some erect filaments, isolated from the felt, some of them supporting at their extremity a rounded agglomeration of greenish sporules, others terminated by a flat margined disc, which appeared to be the state of the filament after the fall of the sporules.

It seems that this fact of the presence of Moulds in the air-cells of a bird, satisfactorily proved as it appears to be by the observations of M. Deslongchamps, must often occur in domestic poultry that live in places where these vegetable productions are abundant, and devour bodies that are covered with them, and whose respiratory organs must often be exposed to the contact of sporules suspended in the air. But it is very possible, as the author himself remarks, that the phænomenon is less rare than it appears to be; and that if it has escaped observation till now, it has arisen from the circumstance that in general no interest is taken in investigating the cause of the death of domestic fowls, and that it will probably be by chance if a similar case to that discovered by M. Deslongchamps should be met with.

The above is the abstract given in the 'Bibliothèque Universelle' of M. Deslongchamps's letter in the 'Comptes Rendus,' a transla-

* See the notice of fungi on insects in our present Number, p. 217.

tion of the whole of which will be found in Jameson's Edinburgh New Phil. Journ. vol. xxxi. (No. 62.) p. 371. But the writers are mistaken in supposing that this phenomenon had hitherto escaped notice, as a similar fact observed in the Flamingo was communicated to the Zoological Society by Prof. Owen in 1832. As it appears that the dissection of the Eider Duck was performed almost before it was cold, the doubt suggested in the Editor's note, whether the *mucor* may not have formed after death, is obviated, especially as a part of it was found in full maturity.

"August 28th, 1832.—Mr. Owen read some Notes on the Anatomy of the *Flamingo*, *Phœnicopterus ruber*, Linn.: they were derived from the examination of an individual which died about three months since in the Society's menagerie.

"The principal diseased appearances were in the lungs, which were filled with tubercles and *vomicæ*. I was much struck with finding the inner surface of the latter cavities, and that of most of the smaller ramifications of the bronchial tubes, covered over with a green vegetable mould, or *mucor*. As the individual was examined within twenty-four hours after its death, it seemed reasonable to conclude this *mucor* had grown there during the life-time of the animal. Thus it would appear that internal parasites are not exclusively derived from the animal kingdom, but that there are *Entophyta* as well as *Entozoa*."

[“The fact here stated must be regarded as a very interesting and remarkable one: there is no reason, *à priori*, why *Entophyta* should not exist; but in the case now before us,—as a certain number of hours did intervene between the death and the examination of the Flamingo, and we have reason to believe that *mucor* will occasionally form very rapidly on dead animal substances, while the *vomicæ* and bronchial tubes of the animal must have contained matter in a high degree susceptible of being organized (whether by seeds and *ova* or otherwise) into either *mucor* or *animalcula*,—it is equally probable, perhaps, that the formation of the *mucor* did not take place until after death.—EDIT.”]

Philosophical Magazine, Jan. 1833, *New Series*, vol. ii. p. 71.

On some Mammalia, Birds and Fishes lately observed in the neighbourhood of Aberdeen.—Daubenton's Bat, *Vespertilio Daubentonii*, Leisl., lately added to our Northern fauna by my father (Edin. New Philos. Journ., October Number), occurs plentifully in the Cathedral here; a few weeks ago I found two clusters of about eighty individuals attached to the roof, since which time they seem to have retired to their winter quarters. Specimens from the locality in question will shortly be exhibited in the British Museum. An apparently undescribed *Nycteribia* was parasitical upon the bats, but seemed to be rare: an *Acarus* infested the wings, in which I have often found its nidus. Three species of Shrew have occurred this summer, *Sorex remifer* was taken but once; *S. tetragonurus*, Herm., and *S. rusticus*, Jen., more frequently, and in about equal numbers. Seven specimens of the two latter were procured from the stomach of a Short-eared Owl, which I lately shot in this neighbourhood. It may here be mentioned, that the owl alluded to was infested with an

Ornithomyia differing from all the Eproboscideous insects hitherto described as British.

On the 25th of September I met with a pair of the Lesser White-throat, *Sylvia sylvicola*, at Don-Mouth, and shot one; it seems to be a very rare bird in Scotland, though plentiful further south. On the same day (after an easterly gale) I found on the beach a Pomarine Jager, *Lestris pomarinus*, a young bird of the year, with the central tail-feathers scarcely projecting beyond the rest. The Little Tern, *Sterna minuta*, is common here, there being a breeding-place of this species a few miles to the north of Don-Mouth. The only other localities in Scotland where I have observed it are Guillon Point and Tyne-Mouth, in East Lothian, where it occurs in small numbers.

A Shark $7\frac{1}{2}$ feet long was lately taken from a bag-net at the end of Aberdeen Pier, and was publicly exhibited for a few days. It seemed to me to differ in several respects from the Porbeagle, *Lamna cornubica*, and to agree best with the Beaumaris Shark of Pennant, which however is by many considered as a variety of, or even identical with, the species first named. The teeth, for example, were not serrated as they are in the Porbeagle*, and the snout was less elongated, being short and obtuse. Along with the shark was displayed an enormous Fishing Frog or Angler, *Lophius piscatorius*, which the fishermen say is not uncommon upon this coast.—JOHN MACGILLIVRAY.

On the Common Hare of the Gangetic Provinces, and of the Sub-Himalaya; with a slight notice of a strictly Himalayan species. By B. H. Hodgson, Esq., Resident at the Court of Nepal.

(LEPUS MACROTUS et OIOSTOLUS, nobis.)

It has often been remarked, that the ordinary type of the genus *Lepus* in the Gangetic provinces differs materially from that of England, and it has been further alleged, that the Hare of the Sub-Himalayan ranges of hills is not similar to that of the plains below them. No one however has, I believe, heretofore been at the pains to verify or refute these allegations, which I therefore now propose to test, and to show that the former is sound, the latter unsound. I have specimens of the ordinary Hare of the plains and of the hills now before me, and after the most careful comparison, can discern no difference between them in size, proportions, or even in intensity of hue in the colours, further than as such everywhere varies with age, health and seasons. The type therefore of this genus in the mountains and in their subjacent plains (on this side the Ganges at least) is the same; and of this species, which we shall call *macrotus* (from the large size of its ears), the females are, as usual, somewhat larger than the males, being from snout to rump 19 to 20 inches, with an average weight of 6 lbs. and a maximum of $8\frac{1}{2}$ to 9, whilst the males fall short by 1 inch or more of this size, and seldom surpass 5 lbs. in weight. The general structure and proportions are those of *Lepus timidus*, but the size is much less, the English hare

* See Dr. Johnston's description in Parnell's 'Fishes of the Frith of Forth,' probably taken from Yarrell's standard work.

being ordinarily 8 lbs, and frequently reaching 12 lbs. ; and if I may trust my notes, as well as the fresh specimens now on the table before me, the females of *macrotus* invariably have six teats, of which two are placed on the very top of the thorax, and four remotely from them in a parallelogram in the central part of the abdominal region. This is a noticeable circumstance, if the six to ten mammæ of authors be ascribed to the genus with sufficient care, and if *timidus*, or the European type, may be thence presumed to have ever more than six. If so, the invariably restricted number of mammæ in *macrotus* will form one feature of specific independency ; another will be deduced from its inferior size ; and a third from the greater length of the ears as compared with *timidus*, to which, in its general proportions and colours, it certainly bears a close resemblance ; even in colours however, there is at least one material and constant difference ; that whereas the dorsal aspect of the scut or tail in *timidus* is black, in *macrotus* it is of similar hue with the back, but paler. Nor do I notice in *macrotus* any peculiarity of structure in the hair (towards tips enlarged, acuminate, and recurved) such as is ascribed to that of *timidus*. The general colour of the Indian Hare is a deep cinnamon-red, copiously mixed with black on the body superiorly, but unmixed upon the limbs and front of the neck and chest, and also on the nape and dorsal aspect of the neck near it ; pure white upon the head and body below, as well as upon the insides of the limbs near it, upon the genital region, posterior margin of the buttocks, and whole inferior and lateral surfaces of the tail. The front of the upper lip, the margin of the mouth, a circle round the eye, and a line thence to the nostril are always pale, rufescent, hoary, or purer white, and so also the bases of the ears dorsally, and a strip thence continued towards the shoulders, and bounding the purely ruddy hue of the soft nape. The superior margin of the ears on both sides is black, but the general hue of the fur on the ears anteriorly is similar to that of the head, whilst posteriorly and interiorly the ears are nearly nude. The mustachios (which are not undulated) are half black and half white, and though the arms or cubits are usually unmixed with black, yet this is not always the case, the animal in very high fur having the cubits, like the tibiæ (externally), powdered with black. The fur in general is very rich, full and soft, both the woolly and hairy portions, the former of which seldom exceeds an inch in length, whilst the latter varies from $1\frac{1}{8}$ to $1\frac{1}{2}$ inch. The hair has mostly four rings from the base, thus—bluish hoary, black, red and black. The wool wants the terminal black ring everywhere, and is for the most part white, but ruddy apically : the hair wants it on the purely red parts of the animal, such as the abdominal aspect of the neck and the limbs ; and both wool and hair are devoid of all rings, and wholly white upon the belly and parts adjacent, as well as upon the inferior surface of the head. Some hairs are wholly black or dusky on the back ; but in general, besides its bluish hoary base, every hair on that surface of the animal has two black rings divided by a red one, which latter is of a deep cinnamon hue, almost exactly, or if the reader pleases, brownish red. The buttocks posteriorly are less dashed with black than the middle of the back, which in fine furred animals

is very dark; but the ordinary dorsal colouring of the hair and wool prevails on the buttocks, as well as on the dorsal aspect of the tail, both parts being like the back, though somewhat paler. Occasionally the wool and base of the hair are dusky rather than hoary, and the intensity of the red hue, as well as the quantity of black tipped hairs, depend on health, age and season, both in the hills and the plains. There are of course five digits on the fore extremities and four on the hind ones, but the thumb consists of a nail only, and the other anterior digits are gradated, as in our hand; whilst in the posterior extremities the central digits are equal, and of the laterals the interior is the longer. The mustachios are ample, extending much beyond the base of the ears, not harsh, nor adpressed, nor undulated as in *timidus*, and of many lengths. Above the eye are four to six lesser bristles, and two or three longer ones below it on each cheek. Eyes remote, and much nearer to the ears than to the snout; ears considerably (or $\frac{1}{3}$ th) longer than the head, so that when pulled forward they may be extended from $1\frac{1}{2}$ to 2 inches beyond the tip of the nose. Head compressed, and arched entirely along the vertical line. Scut without the hair extending only half way from the knee towards the heel of the straightened leg, and with the hair falling considerably short of the os calcis.

The following dimensions will complete the illustration of this species as found in the mountains and plains:—

	Plains.		Hills.	
	Mas.	Mas.	Fcem.	Fcem.
Snout to base of scut	1-6	1-6	1-7	1-7
Snout to occiput straight	4	4	$4\frac{1}{8}$	$4\frac{1}{8}$
Ditto ditto, by curve	$4\frac{3}{4}$	$4\frac{3}{4}$ plus	$4\frac{3}{4}$	$4\frac{3}{4}$
Snout to fore angle of eye	2 less	2 plus	2	2
Thence to anterior base of ear	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{1}{2}$	$1\frac{1}{2}$
Ears, length from skull	$4\frac{3}{4}$	$4\frac{3}{4}$	5	5
Ditto, ditto from anterior inner base	$3\frac{5}{8}$	$3\frac{5}{8}$	$4\frac{1}{4}$	$4\frac{1}{4}$
Width between eyes	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{6}{16}$	$1\frac{6}{16}$
Scut only	$3\frac{1}{2}$	$3\frac{5}{8}$	$3\frac{5}{8}$	$3\frac{5}{8}$
Scut and hair	$4\frac{7}{8}$	5	5	5
Olecranon to carpus	$3\frac{1}{16}$	$3\frac{1}{16}$	$3\frac{1}{16}$	$3\frac{1}{16}$
Thence to tip, long finger (not nail) .	2	2	$2\frac{1}{16}$	$2\frac{1}{16}$
Tibia or knee to os calcis	$4\frac{1}{16}$	$4\frac{1}{16}$	$5\frac{1}{16}$	$5\frac{1}{16}$
Thence to tip long toe (not nail) ..	$4\frac{1}{16}$	4	$4\frac{1}{4}$	$4\frac{1}{4}$
Girth behind shoulder	$9\frac{1}{2}$	$9\frac{3}{4}$	$10\frac{1}{2}$	$10\frac{1}{2}$
Weight (very thin)	$4\frac{1}{2}$ lbs.	$4\frac{1}{2}$ lbs.	5 lbs.	5 lbs.

The following specific character may perhaps serve to distinguish our animal:

Lepus macrotus, with black tipped ears longer than the head. General colour full cinnamoneous red, shaded above with black; tail dorsally concolorous with the buttocks; head below and belly pure white; in size less than *timidus*. Snout to rump 18 to 20 inches,

and weight 5 to 7 lbs. Head (straight) 4. Ears 5 inches. *Habitat*. Gangetic plains and Sub-Himalaya.

Of the Tibetan species I possess only some wretched remains, which enable me however to indicate the species thus:—

*Lepus Olostolus**, with fur consisting almost wholly of wool, considerably curved, and interspersed rarely with very soft hairs. Slaty gray-blue for the most part and internally, but externally fawn-tinted above, and whitish below and on the limbs: some hairs on the back tipped with black beneath a subrufous ring. Tail white, with a gray-blue strip towards the back. Apparent size of the last. *Habitat*, the snowy region of the Himalaya, and perhaps also Tibet.

Hares of the first species are exceedingly abundant in the Nepalese Tarai and British districts near it, but less so in the mountains, though there also they may be found in most districts wherein the declivities of the mountains are not very precipitous nor wholly covered with dense forests. Hares love the lower and more level tracts within the mountains, where grassy open spots are interspersed with copsewood, under which they may safely rest and breed; for in the mountains the hare never resorts to holes or burrows; nor, I believe, voluntarily in the plains, though I have heard the assertion that it does so. In the plains, patches of grass interspersed with cultivation are the favourite resorts of this species, or Jhow shrubberies fringing the banks of nullahs, where occasionally the animals congregate in numbers wholly unknown to the mountains. The Indian Hare, or *macrotus*, breeds frequently during the whole year, and produces usually two young ones at a birth. The young are born with the eyes open, and furnished with teeth. In June 1835 I took two from the left horn of the uterus (none in the right) of a female; and these young, though unborn, had the eyes open, and the fur quite perfect. In fact, the young follow their dam as soon as they are born.

Cathmandoo, February 1841.

Nepal, March 1st, 1841.

The account of the Hares which I sent you was written *currente calamo*, and without my being at the trouble to look (shame on me!) at my own Catalogue of Mammals apud 'Linnæan Transactions,' where the Hare of the plains is named *Indicus*, and that of the Himalaya *Æmodius*. These names might do, and changes are bad; but tropical appellations are objected to, and in the plains there is another Hare, *nigricollis*, wherefore the names affixed to my paper with you should perhaps stand; but a note at the foot of the page should identify them with *Indicus* and *Æmodius* respectively of the Catalogue: thus, "These species are named respectively *Indicus* and *Æmodius* in my published Catalogue. Nor perhaps was it worth while to drop the local appellations, though *nigricollis* constitute a second species in the plains of India."—B. HODGSON.

Journal of the Asiatic Society of Bengal, vol. ix. p. 153.

* As the Tibetan Hare had previously been described by Mr. Waterhouse, we presume that Mr. Hodgson's name *Olostolus* must give place to *Tibetanus*. See p. 226 of the present Number.—ED.

THE HOOPOE.—UPUPA EPOPS.

A fine specimen of the Hoopoe was shot at Longton, not far from Preston, on the 23rd of September last. I saw the bird in the hands of a bird-stuffer in Preston, therefore there can be no mistake respecting its identity. I never heard of one being taken before in these parts*.

JOHN SKAIFE.

8 Union Street, Blackburn, Lancashire,
Oct. 21, 1841.

THE HOOPOE.—THE ARCTIC GULL.

On September 25th last, a specimen of the Hoopoe (*Upupa epops*) was shot near Great Rolbright, Oxon; it had been seen in the vicinity three or four days, and when shot was very wild; first starting up from a wet furrow in a wheat-stubble field, and settling on a bare space in a turnip-field adjoining, where it would not suffer an approach near enough to be shot, but flew to a sainfoin ground adjoining, where, at a long distance, it was brought down on the wing.

On the 28th of the same month a young individual of *Lestris parasiticus*, Arctic Gull, was shot in this neighbourhood, which I have preserved.—T. GOATLEY.

Chipping Norton, Oct. 20, 1841.

ORNITHICHNITES, OR FOOT-MARKS OF EXTINCT BIRDS.

At the first meeting of the Association of American Geologists, founded in Philadelphia, on the 2nd of April 1840, (Prof. Hitchcock, Chairman, and Prof. Beck, Secretary,) among other proceedings, specimens were presented of the sandstones of Massachusetts, exhibiting the fossil foot-marks, so called †, and observations made in regard to them. This subject was of so much interest as to induce the Association to appoint a committee to visit the localities and to report their conclusions. These were delivered at the next meeting, April 7, 1841.

Report on the Ornithichnites or Foot-marks of Extinct Birds in the New Red Sandstone of Massachusetts and Connecticut, observed and described by Prof. Hitchcock, of Amherst.

The undersigned, forming the committee to whom the subject of

* We have recorded two instances of its occurrence in the course of 1840:—in May, near Swansea, vol. vi. p. 236; and in September, near Halifax, *ib.* p. 159.—ED.

† On the subject of these fossil foot-marks see Prof. Hitchcock's paper entitled "Ornithichnology," in Silliman's Journal for January 1836, vol. xxix. art. xx., and the plates by which it is illustrated; also for April 1837, vol. xxxii. p. 175.

The account of Mr. Cunningham's and Sir P. G. Egerton's communications to the Geological Society, Nov. 21, 1838, (see 'Philosophical Magazine' for Feb. 1839, p. 148,) relative to the impressions at the quarries of Storeton Hill, near Liverpool, had been thus noticed in Silliman's Journal for July 1839, p. 394:—"We have recently received from Prof. Buckland fine copies of these impressions, and it is no more possible to doubt the genuineness of their originals, than those of the most recent impression of a foot made in any yielding surface of the present hour. The same is true of the impressions of Prof. Hitchcock, whatever doubt may have been felt by some persons who have never examined them."

the origin of the bird-tracks of Prof. Hitchcock was assigned, beg leave to present the following brief report :

It may be well previously to state, that the object of the meeting in appointing this committee was founded solely upon the desire to produce, if possible, unanimity of opinion, there being a few of the members who dissented from the views published by Prof. Hitchcock. In our country, the subject, as it undoubtedly ought, had attracted considerable attention. It had been very favourably received and republished in Europe, and from its great importance to Palæozoic geology, an attempt should be made to settle the question ; for were the views of our highly respected member correct, we were made acquainted with the earliest period in which biped animals existed whose foot-marks were analogous to, if not identical with, those of the tread of birds. On the contrary, if wrong, we were presented with another class of facts, which show that certain appearances, supposed to belong solely to animal life, were held and presented by the vegetable kingdom likewise.

We shall now state, in a few words, what we suppose are the general facts upon which Prof. Hitchcock's views were founded, and then the facts of those who assumed the opposite opinion.

The first and most obvious impression upon the mind, on looking at the indentations or marks, is their thin tripartite form, resembling the tread or foot-mark of those kinds of birds which show three toes, the fourth one being rudimental, and are referable to no other known kind of animal. The tracks or foot-marks in several localities are arranged in a determinate order, like those of a bird or fowl moving in a straight line, the toes or marks in all such cases being alternate ; that is, if the right foot be presented on the rock, the left would next follow, and thus right and left in regular succession, sometimes with many repetitions. In other instances the foot-marks presented no determinate direction or order, as might naturally be supposed of a bird or any other animal having no particular place or object in view.

In all cases where a succession of tracks was observed, there was an uniform correspondence as to size, and considerable regularity as to distance between the tracks. Whatever deviations were observed, they were not greater than might be supposed to take place in animals possessed of voluntary motion.

On some surfaces, not unfrequently one or more different kinds of track were exposed, belonging, as was reasonably conjectured, to different species and genera of ornithichnites.

That the slaty material of the rock showed that the impressing body possessed force or weight, for frequently the thin layers or laminae were bent downwards for an inch or more, and that the mud of which the slate was formed was of a highly adhesive or tenacious character.

In all cases the foot-mark, or part impressed, was the fixed part of the rock ; the part removed when the lower side was turned upwards showed the cast, or what corresponded with the toes or foot. That no trace of any organic matter could be perceived occupying the cavity or mould, the cast or part in relief being in all respects like the material of the rock of which it formed a part.

Finally, that the foot-marks belonged to a group of rocks which must be considered to have been produced by the same general causes which gave rise to the new red sandstone of Europe, and referable only to that sandstone. This sandstone presents foot-marks in many localities, though comparatively but a few years have elapsed since attention has been called to them. Some of the specimens have reached this country, and had they not, the information is well given by Dr. Buckland in his Bridgewater Treatise. The most remarkable of these foot-marks is that of the *Chirotherium* from the quarries of Hessberg, near Hildburghausen in Saxony, and greatly resembles a fleshy human hand. These, in the drawing and in the specimen which we have seen, are alternately right and left. Other foot-marks have been observed by Mr. Linse in the same sandstone, having made out four species of animals, some of which are conjectured to belong to gigantic Batrachians. Near Dumfries, the foot-marks of animals, probably tortoises, were obtained from the same sandstone, but as yet no tracks like those of New England have been discovered.

The facts, &c. which led to a different conclusion are these. First, that the forms assumed by fucoidal plants were numerous and imitative, some resembling the tail of a rooster, the *cauda galli*; another, which was like a large claw or paw, and which may have been a *lusus naturæ*; and the two specimens on the table of the Association, which present in relief a distinct tripartite form. As these all appertain to rocks of great antiquity in comparison with those of New England, it appeared more reasonable to believe that there might be resemblances as perfect, as the fossils with a tripartite character were approximations to the forms in question.

That no trace of organic matter could be discovered by the eye in the greater number of the *Fucoides*. In some, such as the *Harlani*, they have been seen to be made up of small pebbles, presenting no little difficulty, not to the manner only in which the organic matter was replaced, the external form being complete, but the nature of this material, which could make so definite an impression and preserve its form entire.

There were other facts which showed resemblances, such as that the part in relief was the part removed when the *Fucoid* was attached to the sandstone at its upper part. It may also be stated, that the appendages to the heel of some of the New England tracks might have been caused by a bird whose legs were feathered, but not a wader; and they favoured their vegetable origin, for the appendages might readily be conceived to be either leaves or radicals, or both.

From a comparative examination of the facts on both sides, your committee unanimously believe, that the evidence entirely favours the views of Prof. Hitchcock, and should regret that a difference had existed, if they did not feel assured it would lead to greater stability of opinion. To liken things to what we know, is the nature of mind; the error from this tendency increases with ignorance, and diminishes as knowledge increases; so that he that knoweth all things, as is self-evident, can commit no error when following this instinct of

his being. The discoveries of Prof. Hitchcock were published at a period when the minds of those who embraced the negative side of the subject were pre-occupied with the anomalous vegetation with which many of the Silurian rocks of New York abound, and to which provisionally the name of *Fucoides* had been given. From this imitative character, and from finding a few specimens presenting a tripartite or trifurcate form, &c. it appeared not only possible but probable, that the impressions from Massachusetts and Connecticut were with greater propriety referable to fucoidal bodies, than to those which Prof. Hitchcock had assigned them.

We may here remark, how essential it is that truth, or the facts which make manifest any truth, should first be presented to us; so readily is the mind impressed when not pre-occupied; and when a strong impression is made, be it ever so false, it is no easy matter to free ourselves from it. From this circumstance we can readily foresee the advantage which future generations will possess over those of the present and especially those of former times. As the progress of knowledge is certain, each day will lessen error and enlarge the domains of truth; and should man be true to his permanent interests, error finally will cease to have existence.

(Signed) HENRY D. ROGERS, LARDNER VANUXEM, RICHARD C. TAYLOR, EBENEZER EMMONS, T. A. CONRAD.

[NOTE.—We have just seen an engraving of a large Fucoid which has very lately been found by Mr. Cunningham in the same Storeton quarry that has afforded *Labyrinthodon* and *Rhyncosaurus* footmarks, plainly showing how little resemblance an actual Fucoid bears to the *Ornithichnites*.—EDIT.]

NATURAL HISTORY AS A BRANCH OF EDUCATION.

To the Editors of the Annals and Magazine of Natural History.

DEAR SIRS,—It may be interesting to some of your readers to know, that the importance of Natural History as a branch of education* for the Christian ministry, has been recognised by the different Presbyterian bodies of this part of the empire. To the Reformed Presbyterian Synod (the Covenanters) belongs the honour of being the first to assign to this study a place in the College curriculum of its students. By a letter from the Natural History Society of Belfast, the subject was brought before the General Assembly of the Presbyterian church in Ireland at its late annual meeting in this town; and their College Committee, to whom the matter was referred, passed a resolution strongly recommending the students under its care to make themselves “extensively acquainted with Natural History in its several departments, not only on account of the great importance of the science, but of its special bearing on the sublime sphere of the Christian ministry.”

The same subject was, in like manner, brought under the consi-

* [Mr. Patterson's Pamphlet on Natural History as a Branch of Education will be found reviewed in the preceding volume of the *Annals*, p. 498.—ED.]

deration of the Association of Irish Non-subscribing Presbyterians, at their recent triennial meeting held in Newry; and a Committee of that body was appointed to consider and suggest to the proper authorities any improvements in the Undergraduate course which may appear desirable; and directions were given, that in the contemplated improvements, the study of Natural History should not be forgotten.

When the sober-minded Presbyterians of the north of Ireland are thus giving their deliberate testimony to the importance of the study, may we not hope that a time may yet come when it shall be universally introduced as a regular branch of education both in our schools and colleges?

I am, your very obedient,

Belfast, 27th Sept. 1841.

ROBERT PATTERSON.

METEOROLOGICAL OBSERVATIONS FOR SEPT. 1841.

Chiswick.—Sept. 1. Very fine. 2. Slight fog: very fine: clear. 3. Very fine: showery: heavy rain. 4. Stormy and wet. 5. Cloudy and fine: rain: cold fog. 6. Dense fog: hazy: foggy at night. 7. Foggy: rain. 8. Fine. 9. Overcast. 10, 11. Foggy: very fine. 12, 13. Very hot for the period of the season. 14. Dry haze: very fine. 15. Very fine: rain at night. 16—20. Very fine. 21. Hazy: very fine. 22. Rain: very fine. 23. Heavy rain. 24. Cloudy: rain. 25. Showery. 26. Showery: stormy with rain at night. 27. Fine: lightning and very heavy rain at night. 28. Rain: boisterous. 29. Boisterous: clear at night. 30. Boisterous, with rain: clear and fine.

Boston.—Sept. 1. Foggy: rain yesterday P.M. 2. Fine. 3. Rain: heavy rain P.M. 4. Cloudy: stormy, with rain P.M. 5. Cloudy: rain P.M. 6. Fine. 7. Cloudy: rain P.M. 8. Cloudy. 9. Fine. 10. Cloudy: thermometer 74° three o'clock. 11. Cloudy. 12. Fine: thermometer 80° half-past eleven o'clock A.M. 13. Fine: thermometer 74° three o'clock P.M. 14. Fine. 15. Cloudy. 16. Fine: rain A.M. 17. Fine. 18. Foggy. 19—21. Cloudy. 22. Cloudy: rain A.M. 23. Rain A.M. 24. Cloudy: rain early A.M. 25. Fine. 26. Cloudy: rain early A.M.: rain P.M. 27. Fine. 28. Stormy: rain early A.M. 29. Stormy. 30. Cloudy: rain early A.M.: rain P.M.

Applegarth Manse, Dumfries-shire.—Sept. 1. Fair till P.M., then rained. 2. Continued rain P.M. 3. Fair and fine. 4. Fair and fine, but cloudy A.M. 5. Fair and fine. 6. Fair and fine: hoar-frost A.M. 7. Cloudy A.M.: rain P.M. 8. Wet A.M.: cleared up. 9. Wet nearly all day. 10. Wet throughout. 11. Cloudy A.M.: wet P.M. 12. Hot sun: fiery wind: thunder. 13. Clear: fiery wind: thunder. 14. Showery A.M.: wet P.M.: thunder. 15. Cloudy, but fair: thunder. 16. One shower. 17. Fair and clear. 18, 19. Fair and fine. 20, 21. Fair and fine, though windy. 22. Shower in the afternoon. 23. Fair and fine. 24, 25. Showers. 26. Wet A.M.: cleared and was fine. 27. Fair but threatening. 28. Heavy showers. 29. Heavy rain all day: thunder. 30. One or two slight showers.

Sun shone out 26 days. Rain fell 15 days. Thunder 5 days. Frost, hoar, 2 days.

Wind North-north-east 1 day. North-east 1 day. East-north-east 1 day. East 7 days. East-south-east 4 days. South-east 4 days. South-south-east 1 day. South 4 days. South-south-west 2 days. South-west 2 days. West-south-west 1 day. West-north-west 1 day. North-west 1 day.

Calm 9 days. Moderate 9 days. Brisk 4 days. Strong breeze 8 days.

Mean temperature of the month 53°·90

Mean temperature of Sept. 1840 53·30

Mean temperature of spring-water 50·80

